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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* PAUL ANTHONY BRISTOW, SCOTT MICHAEL DAVIS,  
JESSE GUY HIPWELL, RANDALL TODD MYERS,  
and ERICH OTTO TEUTSCH

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Appeal 2009-005370  
Application 10/805,760  
Technology Center 1700

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Decided: April 28, 2010

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Before BRADLEY R. GARRIS, TERRY J. OWENS, and  
MARK NAGUMO, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's  
decision rejecting claims 2-16 and 18-23. We have jurisdiction under 35  
U.S.C. § 6.

We AFFIRM-IN-PART.

Appellants claim a method of forming a layered article comprising thermoforming a substrate sheet to form a shaped substrate, wherein the shaped substrate is a fiber-reinforced plastic material having a certain void content, pulling a vacuum through the shaped substrate, and pulling a film layer onto a surface of the shaped substrate to form the layered article (claim 3). The shaped substrate may be foraminated (claim 7). Appellants' claimed method also comprises the step of cooling the thermoformed substrate to form a shaped substrate (claim 22) and a thermoforming step which includes heating the substrate sheet to a temperature sufficient to loft the fibers (claim 23).

Representative claims 3, 7, 22, and 23 read as follows:

3. A method of forming a layered article, the method comprising:

thermoforming a substrate sheet to form a shaped substrate, wherein the shaped substrate is a fiber-reinforced plastic material having a void content sufficient to allow a vacuum to be applied through the shaped substrate, wherein the void content is greater than or equal to about 5 vol.%, based on the total volume of the shaped substrate;

pulling a vacuum through the shaped substrate; and

pulling a film layer onto a surface of the shaped substrate to form the layered article.

7. The method of Claim 3, wherein the shaped substrate is foraminated.

22. A method of forming a layered article, the method comprising:

thermoforming a substrate sheet to form a thermoformed substrate, wherein the substrate sheet comprises a fiber-reinforced plastic material having a void content sufficient to allow a vacuum to be applied through the substrate;

cooling the thermoformed substrate to form a shaped substrate,  
pulling a vacuum through the shaped substrate; and  
pulling a film layer onto a surface of the shaped substrate to form the  
layered article.

23. A method of forming a layered article, the method comprising:  
thermoforming a substrate sheet to form a shaped substrate, wherein  
the substrate sheet comprises a fiber-reinforced plastic material having a  
void content sufficient to allow a vacuum to be applied through the  
substrate;

wherein thermoforming comprises heating the substrate sheet to a  
temperature sufficient to loft the fibers;

pulling a vacuum through the shaped substrate; and  
pulling a film layer onto a surface of the shaped substrate to form the  
layered article.

The references set forth below are relied upon by the Examiner in the  
§ 102 and § 103 rejections before us:

Holtrop	4,529,641	Jul. 16, 1985
Nagayama	5,854,149	Dec. 29, 1998
Masui	5,968,629	Oct. 19, 1999
Matich	6,224,706 B1	May 01, 2001

The Examiner rejects claim 23 under 35 U.S.C. § 102(b) as being  
anticipated by Matich.

Under 35 U.S.C. § 103(a), the Examiner rejects:

- (a) claim 22 over Madich;
- (b) claims 2-11, 13, 14, 16, and 18-21 over Matich and Masui;
- (c) claim 12 over Matich, Masui, and Holtrop; and

(d) claim 15 over Matich, Masui, Holtrop, and Nagayama.

The Rejections of claims 2-6, 8-11, 12, 13, 16, and 21

In the rejection of claims 2-6, 8-11, 13, 16, and 21 based on Matich and Masui, the Examiner acknowledges that Matich's substrate is not disclosed as being a fiber-reinforced plastic material having a specified void content as required by claim 3 but concludes that it would have been obvious to use in Matich's process a fiber-reinforced plastic material substrate having a specified void content as taught by Masui (Ans. para. bridging 3-4).

Appellants argue that "one of ordinary skill would not be motivated or prompted to take the material of Masui and use it as the substrate in Matich's molding process" because Matich's air evacuation step would compress the material and reduce void content whereby "the acoustic absorbing properties of [Masui's] material could be lost" (Supp. Br.<sup>1</sup> 10).

Appellants have offered no evidence in support of their contention that Matich's process would compress material and reduce void content to such an extent that the acoustic absorbing properties desired by Masui would be lost. Moreover, Appellants' contention is contraindicated by the applied reference teachings. For example, the fact that Masui's material is subjected to compressive pressure (*see* Abstract) is incompatible with Appellants' contention that the compression step of Matich would cause loss of the

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<sup>1</sup> The Examiner has re-arranged certain claims listed in the rejections presented in the Answer in order to correct claim-listing errors in the Final Office Action (*see* Ans. 3-9). In response to this rearrangement of claims in the Answer, the Supplemental Appeal Brief was filed in order to re-present the arguments of the original Appeal Brief in a manner corresponding to the Examiner's claim rearrangement. We cite to this Supplemental Brief because the arguments therein are presented in a manner consistent with the rejections set forth in the Answer.

acoustic absorbing properties desired by Masui. In addition, particularly since the air evacuation step of Matich is temporary (col. 4, ll. 13-40), it is unclear why this step would reduce the void content of Masui's material as Appellants contend.

Appellants also argue that "Matich does not first form a shaped substrate" (Supp. Br. 9).

However, claim 3 does not require first forming a shaped substrate prior to the vacuum pulling step and therefore does not distinguish from Matich's process wherein a shaped substrate is formed during application of vacuum and heat (Matich, col. 4, ll. 13-30).

In rejecting claim 12 over Matich, Masui, and Holtrop, the Examiner acknowledges that Matich does not disclose plug assist vacuum molding but finds that "Holtrop shows a method wherein the substrate sheet is thermoformed with a membrane assisted vacuum pressure forming method with plug assist (Column 5, lines 3-5)" (Ans. 8). The Examiner concludes that it would have been obvious "to use Holtrop's plug assist vacuum molding as that of Matich's vacuum molding process in order to facilitate the most efficient vacuum molding available" (*id.*).

Appellants contest the Examiner's obviousness conclusion on the grounds that "Holtrop does not disclose that Holtrop's plug assist vacuum molding is 'the most efficient vacuum molding available'" (Supp. App. Br. 14).

Appellants' argument is not well taken. Even if Holtrop's plug assist vacuum molding is merely an adequate, rather than the most efficient, vacuum molding, Appellants fail to explain why there would be no motivation to use a molding technique known in the art to be adequate. The

record before us evinces that the molding technique defined by claim 12 is known in the art as shown by Holtrop and would have been used in the process of Matich in order to effect the vacuum molding function desired by Matich.

For the above-stated reasons, we sustain the Examiner's § 103 rejections of claims 2-6, 8-11, 13, 16, and 21 over Matich in view of Masui and of claim 12 over Matich, Masui, and Holtrop.

The Rejections of claims 7, 14, 15, 18-20, 22, and 23

The Examiner finds that claim 23 is anticipated by Matich (Ans. 3).

This finding is erroneous. Appellants correctly argue that Matich fails to disclose the claim 23 step "heating the substrate sheet to a temperature sufficient to loft the fibers" (Supp. Br. 6). Furthermore, there is no merit in the Examiner's apparent belief that the claim 23 heating step involves "intended use" as correctly explained by Appellants (*id.*).

For at least this reason, we cannot sustain the § 102 rejection of claim 23 as being anticipated by Matich.

The above-discussed deficiency of Matich also applies to claims 14, 15, and 18-20 since these claims likewise require the heating step under consideration. Therefore, we also cannot sustain the Examiner's § 103 rejections of these claims.

The Examiner's rejection of claim 7 is based on the proposition that Matsui's "expanded" substrate reads on the claim 7 limitation "wherein the shaped substrate is foraminated." According to the Examiner, "it is being interpreted that 'expanded' implies a foamed structure, which is functionally equivalent to a foraminated structure" (Ans. 5).

The Examiner provides no support for the statement that a foamed structure is functionally equivalent to a foraminated structure. In addition, we fully agree with Appellants that, according to their Specification disclosure, “the term ‘foraminated’ is used throughout this disclosure merely for convenience to discuss systems having holes other than those formed by a network of cells in fluid communication with each other” (Supp. Br. para. bridging 11-12, quoting Spec. para. [0022]).

For these reasons, we cannot sustain the Examiner’s § 103 rejection of claim 7 as being unpatentable over Matich in view of Masui.

Claim 22 requires “cooling the thermoformed substrate to form a shaped substrate” which occurs prior to the subsequently recited steps of pulling a vacuum through the shaped substrate and pulling a film layer onto a surface of the shaped substrate. The Examiner acknowledges that Matich’s cooling step occurs after rather than before the vacuum and film layer pulling steps are practiced (Ans. 9). Nevertheless, the Examiner urges that “selection of any order of performing process systems is *prima facie* obvious” and concludes that it would have been obvious to rearrange the steps of Matich’s process so as “to include an intermediate cooling step in order to avoid unwanted deformation of the substrate prior to the attachment of the film” (*id.*).

We agree with Appellants that it would not have been obvious to modify Matich’s process to include a cooling step prior to the vacuum and film layer pulling steps as required by claim 22 (Supp. Br. 17). Indeed, such a modification would be irrational since it would result in performing a cooling step prior to the heating step which occurs during the vacuum and film layer pulling steps of Matich (col. 4, ll. 13-30). *See In re Kahn*, 441



F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”), cited with approval in *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417-18 (2007).

It follows that we also cannot sustain the Examiner’s § 103 rejection of claim 22 as being unpatentable over Match.

Summary

We have affirmed the rejections of claims 2-6, 8-11, 12, 13, 16, and 21 and have reversed the rejections of claims 7, 14, 15, 18-20, 22, and 23.

The decision of the Examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

AFFIRMED-IN-PART

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